Priority Concern: Surface Water

Feedlots and Manure Management

PRIORITY CONCERN: Feedlots and Manure Management

Water Management Plan Goal

Prevent and reduce pollution of surface and ground water with implementation of livestock and nutrient management programs, policies and best practices.

Priority Concern

Livestock feedlot manure can be a source of bacteria, TSS, phosphorus, nitrogen and other pollutants. Most livestock in Blue Earth County is produced in confinement barns with below-barn, concrete manure storage pits. Runoff containing manure used as fertilizer for agricultural crop production is likely the greatest source of pollution from livestock feedlots. Preventing and reducing runoff and protecting groundwater are the highest priorities. Continuing the County Feedlot Program and working with feedlot operators to improve nutrient management planning and application methods in environmentally sensitive areas will be the most important actions related to livestock production and feedlots during the planning period.

Priority Concerns Assessment

Background

There have been many changes in livestock production methods in the past 30-40 years. Modern livestock production involves fewer but much larger, totally confined feedlots. Total confinement barns have replaced open lots, partial confinement barns, shelters and pastures. Another difference is the type of animals produced. In the County, the number of cattle, dairy, turkeys and chickens have declined dramatically, while the number of swine has increased. Blue Earth County is one of the top hog producing Counties in the State.

Awareness of water pollution from feedlots has increased in the past 20 years. In the early 1990s a series of State enforcement actions against several feedlot operators in Blue Earth County brought a great deal of attention to feedlots with direct manure run off to surface waters. The County began aggressively working with feedlot owners to correct feedlot pollution problems. The County also initiated and joined the State in enforcement actions. As a result, most feedlots with direct manure run off were eliminated as many of the operators chose to close these sites and either construct confined facilities to replace the problem sites or discontinue producing livestock. Poorly constructed earthen manure storage pits, basins and other inadequate manure storage facilities were also closed. Blue Earth County was one of the first Counties in the State with a feedlot ordinance. Today Blue Earth County is one of the few Counties with a feedlot program requiring annual County permits and annual permit fees. Feedlots are regulated primarily by Minnesota Rules Chapter 7020. Local programs and regulations are consistent with State of Minnesota Rules.

The SWCD and NRCS have been important partners in feedlot management providing technical support to feedlot operators and the County. For eligible projects, grants to

feedlot operators are available through the SWCD and NRCS. Dozens of feedlots with runoff problems utilized the services and cost share programs through the SWCD and NRCS during the 1990s for fixes such as waste storage, gutters, and surface water diversions.

Today land applied manure is the greatest source of surface water pollution from livestock feedlots in Blue Earth County. Many feedlot operators are doing a good job with manure management and continuing to improve as manure management plans are required for feedlots with 300 or more animal units.

Land applied manure has the potential to pollute surface water two ways: 1) manure runoff from the field, and 2) runoff containing excess nutrients from manure and manure/fertilizer applied above agronomic rates. Manure is more likely to run off when applied without incorporation, applied on slopes, applied close to sensitive areas, or applied on frozen ground. Applying more manure than needed by the crop results in an accumulation of nutrients in the soil. When applied at agronomic rates for phosphorus, most fields require less or less frequent manure than if applied with consideration of only nitrogen needs for crops. Excess nutrients are transported with stormwater and eroded soil particles.

Manure has great benefits as crop fertilizer and can be very valuable depending on current commercial fertilizer prices and availability. Manure is also a waste associated with livestock production. From the feedlot operator's view manure must be managed with consideration of practical needs and economic factors associated with applying the manure. Ideally manure is fully utilized as crop fertilizer and applied at rates related to crop needs and nutrients available using methods to prevent manure or nutrient runoff to surface water according to the feedlot operator's manure and nutrient management plans. Considerations of distance to the field, nutrient density of manure, soil nutrient needs, type of equipment, time, acres, etc. can all influence the operators decisions related to manure application rates.

Liquid swine manure is the greatest volume of manure applied to land in Blue Earth County. Practical considerations associated with manure application from confinement operations relate to timing when manure can be applied to the field and when manure must be removed from the storage pit or basin to allow for adequate storage volume. Weather variables also influence manure management decisions. Wet field conditions, heavy rains, snow, and concerns about ground compaction may limit manure application during a time when the pit is full all influence when, how and where manure is applied to the field.

Manure can also pollute ground water. Although there have been no manure-related ground water problems reported in Blue Earth County, preventative measures can be taken in areas where there is a known susceptibility to ground water contamination.

Environmentally Sensitive Areas

In order to meet State rules for manure management plan preparation, sensitive areas must be addressed. The MPCA forms and guides include the following sensitive areas: lake, stream, intermittent stream, drainage ditch without protective berms, public waters

wetland, open tile intakes, floodplain, road ditch, sinkhole, well, mine, quarry, shallow soil over fractured rock, and other conduits to water.

Ground Water Protection
There are several areas in Blue Earth County identified as highly susceptible to ground water contamination. These include areas with shallow depth of soil to bedrock and areas with coarse, somewhat shallow soils. Ground water is discussed on pages 53-68 of this plan. Map 23 on page 61 displays the geologic sensitivity of the soils.

Shallow depth to bedrock
Shallow soil over bedrock is found along the main river valleys in Blue Earth County including the Minnesota River, Blue Earth River and Le Sueur River. The shallowest depth to bedrock (zero-12 inches) is found along the Minnesota River most notably in Judson Township, South Bend Township, City of Mankato and Lime Township. Map 22 on page 59 displays generalized, depth to bedrock information in Blue Earth County.

Manure is a potential threat to ground water in areas with shallow depth to bedrock. Horses are the most common type of livestock in areas of the County with shallow depth to bedrock. There are eight, relatively small horse feedlots in the County. Many sites with horses have fewer than 10 animal units, do not meet the definition of a feedlot and are not included in the County feedlot inventory. Lime Township has the highest density of horse feedlots, horse barns and horse pastures.

Coarse/Shallow Soils
Areas within the Watonwan River watershed and Crystal Lake watershed are identified as highly susceptible to ground water contamination due to relatively sandy and shallow soils in this area. Swine confinement operations are the most common type of livestock in these areas.

Drinking water wells
The Minnesota Department of Health has identified no vulnerable drinking water supplies or drinking water source protection areas.

The City of Mankato's wells are shallow aquifers located beneath the Blue Earth and the Minnesota River. Due to the relatively shallow position of these wells, the aquifer is more susceptible to contamination compared with deep wells.

Standard MPCA, MDH and County feedlot setbacks apply to all water wells.

Surface waters
MPCA and County setbacks apply to these environmentally sensitive, surface water features: protected waters, lakes, streams, wetlands, ditches, and surface tile intakes. Many intermittent streams are also not identified on maps. Only the landowner knows the location of tile intakes.

Seasonal high water table and saturated soils
The landscape in Blue Earth County is dominated by soil types with a high seasonal high water table. A high seasonal high water table can be a problem for manure storage and manure application. According to the USDA Soil Survey most soils in Blue Earth County are poorly suited for land application of manure due to wetness.

Most below barn, concrete manure storage structures need perimeter tile in order to protect the concrete walls of the pit from cracking and groundwater/pit infiltration. Inspections of these tile systems over time may be necessary for ground water protection.

The water table is lowered in much of the County by privately owned, subsurface tile drainage systems. Even with tile drainage, wetness can limit land application of manure during critical times for manure application before planting in spring and before snowfall in the fall.

Current TMDLs and Water Quality Projects

Lower Minnesota River Dissolved Oxygen TMDL
The Lower Minnesota River Dissolved Oxygen TMDL Implementation Plan includes MPCA activities that will involve Blue Earth County. The implementation plan states:

> "MPCA will pursue increases to the level of manure management plan review required of County Feedlot Officers (CFOs) in their annual work plans. Initially, the focus will be to ensure that producers are keeping the required records and maintaining required manure management plans. By 2010, the goal will be to include more in-depth analysis of soil test phosphorus levels and manure application methods and frequencies that are documented in producer records and manure management plans. "

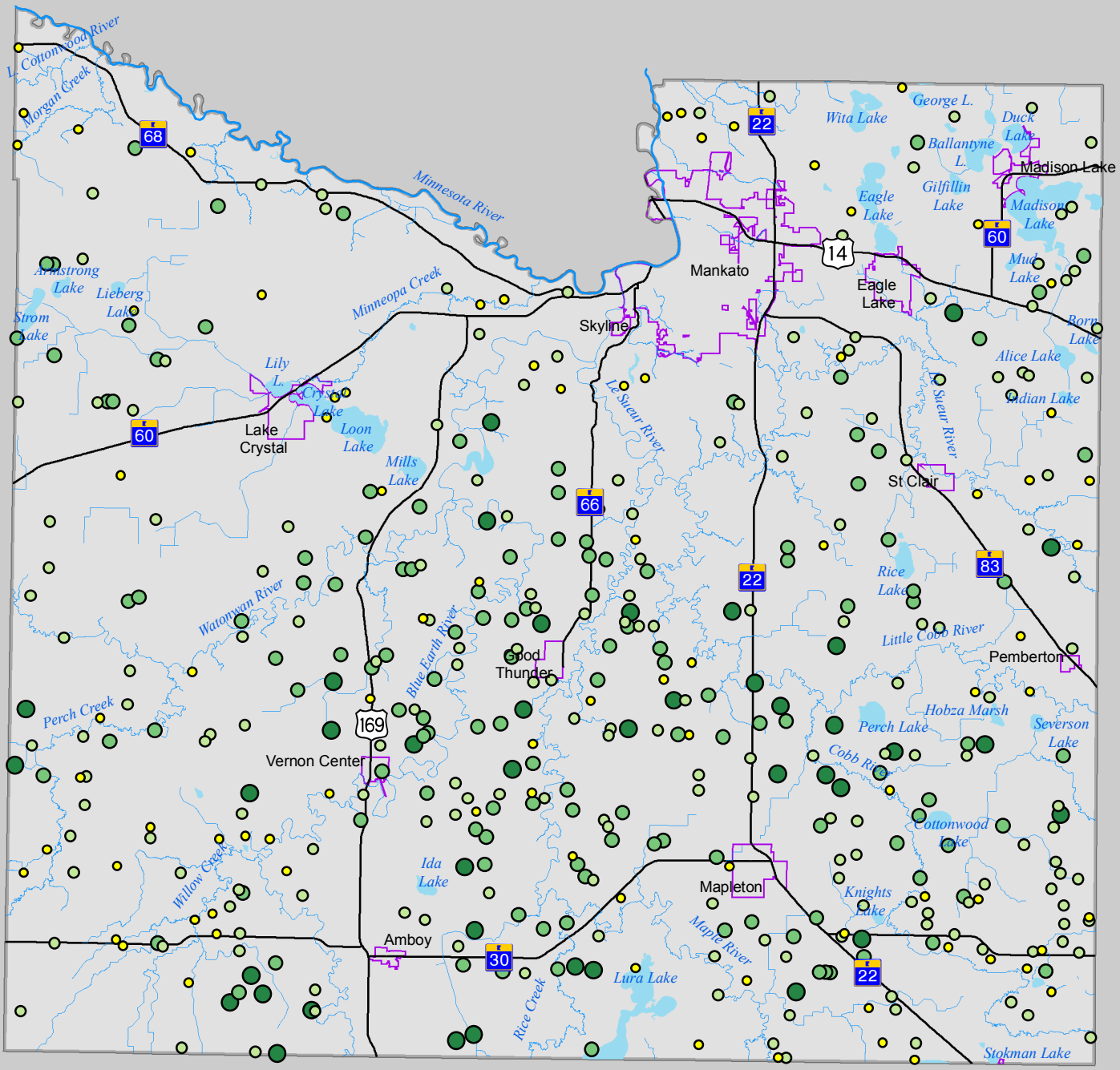
Greater Blue Earth River Fecal TMDL
The draft Blue Earth River Fecal TMDL Implementation Plan includes activities that will involve Blue Earth County. The implementation plan identifies improving manure management plans and establishing vegetated buffers to reduce manure runoff as priority activities.

Maple River Watershed Clean Water Partnership
The Maple River watershed contains the highest density of feedlots, animal units, and associated volume of manure in Blue Earth County.

Feedlot Inventory

In 2007 there are 440 feedlots in Blue Earth County. Most of the feedlots in the County are located in the southern two thirds of the County. Map 24 displays the location of each feedlot in Blue Earth County.

Map 24. Feedlots



State or U.S. Highway

Lake

City

Feedlot (Animal Units)

- 10 - 49 Animal Units
- 50 - 299 Animal Units
- 300 - 999 Animal Units
- 1000 - 2000 Animal Units

0 5 Miles

N

BLUE EARTH COUNTY

Prepared By: Blue Earth County
Environmental Services
October 2007

Source: Blue Earth County
Feedlot Inventory
October 29, 2007

The *Zoning Section of the County Code* defines feedlots:

> *Animal feedlot*: means a lot or building, or combination of contiguous lots and buildings, intended for the confined feeding, breeding, raising or holding of animals and specifically designed as a confinement area in which manure may accumulate, or where the concentration of animals is such that a vegetative cover cannot be maintained within the enclosure. For purposes of this article, open lots used for feeding and rearing of poultry (poultry ranges) and barns, dairy facilities, swine facilities, beef lots and barns, horse stalls, mink ranches and domesticated animal zoos shall be considered to be animal feedlots. Pastures shall not be considered animal feedlots under this article.

Many types of livestock are produced in Blue Earth County. Swine, cattle, cows, turkeys and chickens are the most common, but swine production dominates the livestock industry in Blue Earth County. Table 4 summarizes the number of the main animal types.

Table 4. Summary of Main Animal Types in Blue Earth County 2007
Source: Blue Earth County Feedlot Permit Records 2007

	Number of Animals*	Animal Units*
Dairy Cows	975 Cows, 1400 Heifers, 400 calves	2,380
Beef Cattle	13,800 Finishing, 200 Heifers, 1,780 Cow/Calf Pairs, 800 Calves	16,400
Swine Breeding Stock	31,000	12,400
Swine Finishing	340,000	102,000
Swine Nursery	119,000	6,000
Chickens /Laying hens	85,000	850
Turkeys	160,000	2,880

Note: animal numbers are permitted capacity not an actual inventory

The regulated feedlots in Blue Earth County range in size from 10 AU to 2,200 animal units. Most feedlots are those with less than 300 animal units. Of the 440 total feedlots, 288 are less than 300 AU. When viewing feedlots proportionally by the number of animal units produced at each, the feedlots with less than 300 animal units represent only 21% of the total animal units in the County. A significantly large number of total animal units are produced in feedlots between 300 AU and 999 AU. Table 5 summarizes the number of cattle and swine feedlots of varying size ranges and the total animal units in each size.

Table 5. Summary of Cattle and Swine Feedlot Size
Source: Blue Earth County Feedlot Permit Records 2007

Permitted Size in Animal Units	Total Sites	Inactive Sites	No. in Shoreland	Cattle Sites	Swine Sites	Total Animal Units
10-49	96	12	16	68	28	3,000
50-299	196	14	14	61	118	26,500
300-999	122	1	8	9	114	72,000
1,000 or larger	30	0	1	1	29	39,000

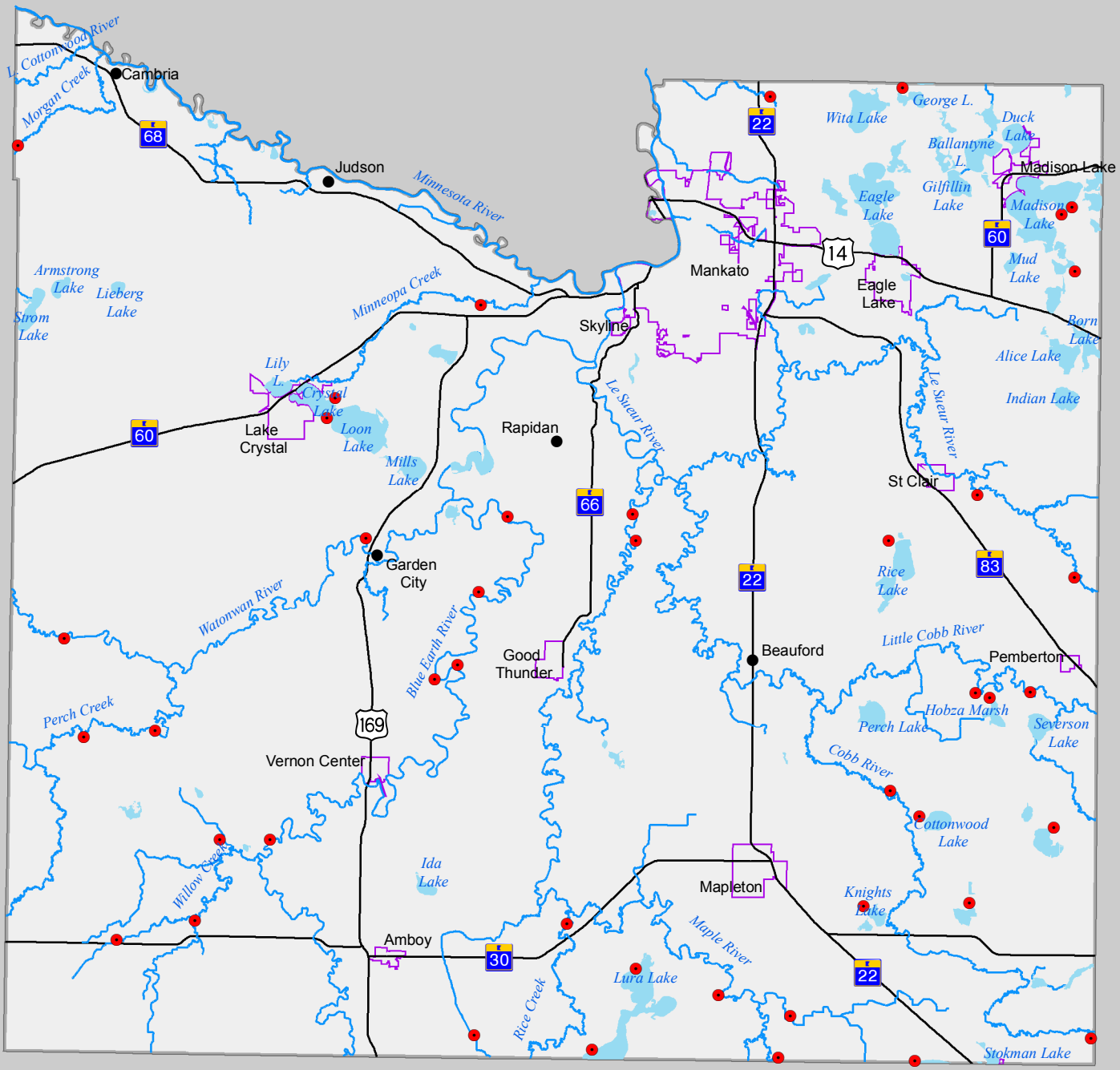
Note: animal numbers are permitted capacity not an actual inventory

Pastures
Pastures are exempt from MPCA feedlot rules. Properly maintained pastures reduce surface runoff and soil erosion and are considered to have less environmental impact than open lots. Pastures are not exempt from State water quality rules. Livestock on pastures are not restricted from accessing lakes, rivers or other waters. Pastures associated with a feedlot are regulated differently than pasture-only operations. Pastures connected to feedlots must register with the MPCA or County, and if located on a lake, a pasture connected to a feedlot must be fenced from the water.

Open Lot agreements
This provision of the MPCA feedlot rules allows small feedlot operators with less than 300 AU to phase in improvements needed to reduce manure runoff. Partial improvements were required in 2005 and the work must be completed by 2010.

Shoreland
Due to close proximity to surface water, feedlots with open lots in Shoreland are considered to have a greater potential for runoff. Map 25 displays the feedlots located within 300 feet of a DNR protected river or stream and within 1,000 feet of a DNR protected lake. Most of the feedlots in Shoreland are less than 300 AU. Of these small feedlots, four have an “Open Lot Agreement”.

Map 25.
Feedlots within Designated Shoreland Areas



- Feedlot Located in a Shoreland Area
- DNR Protected Basin
- Protected Stream or River
- City
- State or U.S. Highway

0 5 Miles

N

BLUE EARTH COUNTY

Prepared By: Blue Earth County
Environmental Services
October 2007

Source: Blue Earth County
Feedlot Inventory
October 29, 2007

Note: Shoreland means land located within the following distances from public waters: 1,000 feet from the ordinary high water level of a lake, pond, or flowage; and 300 feet from a river or stream, or the landward extent of a floodplain designated by ordinance on a river or stream, whichever is greater.

Manure Storage

Under-barn concrete manure storage pits are the most common manure storage system in Blue Earth County. There are also earthen manure storage basins, manure stockpiles and few open lots.

Concrete pits

New, under-barn concrete manure storage pits are generally designed with adequate storage capacity planned for pumping and land application in the fall after harvest. There is very little manure runoff potential from total confinement, below-barn concrete manure storage pits. A greater concern related to this type of manure storage is ground water contamination. With a high seasonal water table in much of the county, perimeter tiles have been constructed around most barns.

The number of feedlots with below-barn concrete manure storage pits increased dramatically in the 1990s as the hog industry expanded. Older sites with run off problems were replaced with new facilities designed with greater capacity to ensure adequate manure storage to reduce the need for pumping out during wet conditions, on frozen ground or when crops are still in the field.

Concrete pits idle for three or more years must be recertified prior to use for manure storage. Recertification involves an inspection and certification by an engineer stating the pit is structurally sound and does not pose any foreseeable environmental concerns. The certification doesn't mean the pit would meet today's standards. Any pit with a clay floor is not in compliance with today's standards and not certified. Clay floors were common before 1990. When a concrete pit is idle for more than five years it must be properly abandoned. Abandoned sites are not part of the County's feedlot inventory.

Manure stockpiles and open lots

In Blue Earth County, manure stockpiles and open lots are most commonly associated with relatively small beef, dairy and poultry operations and sites with horses. Manure stockpiles are land applied in spring and fall. Runoff from the manure stockpile becomes a problem when located near surface water or tile intakes. Runoff is the most significant potential problem with this type of manure storage.

Earthen basins

Construction of new earthen manure storage basins for swine is no longer allowed in the State of Minnesota. Earthen basins must have been designed to NRCS standards to remain certified. In Blue Earth County, all earthen manure storage basins still in use are certified. Earthen basins do require maintenance such as tree and weed removal and rodent control. Earthen basins are regularly inspected as part of the County's feedlot program and site review. Some earthen basins were constructed to correct pollution problems or to extend the life of the barn and improve animal/worker health.

Since the inception of the feedlot program, the County has worked with feedlot owners to discontinue use and properly abandon uncertified earthen basins. Currently there are three inactive, un-certified earthen basins in the County. The County and the MPCA do not allow the owners of these sites to utilize the basins for manure storage. The County does keep these facilities in the County feedlot inventory by requiring a feedlot permit until they are properly abandoned.

Blue Earth County Feedlot Program

The County's feedlot program consists of permitting, inspections, enforcement, education, data management and reporting. The strength of the County's program lies in the continuous, systematic review of each individual feedlot by a full-time Feedlot Officer in the Environmental Services Department. The County Feedlot Officer position was established in 1995. Blue Earth County's Feedlot Program is funded with a combination of local permit fees paid by the feedlot operator to the County, State feedlot grant, and County property taxes.

Blue Earth County is a State-delegated feedlot program. The County is responsible for implementation of feedlot rules and regulations with the exception of large feedlots with 1,000 or more animal units that require federal permits (NPDES). The County has been delegated administration of the following State regulations: registration, permitting, inspections, education and assistance, and complaint follow-up. The County is required to submit an annual work plan for review and approval by the MPCA.

Feedlot Inspections and Permit Review

The County Feedlot Officer conducts a continuous, systematic review of all feedlots. Feedlots are inspected approximately every three years. Every feedlot in Blue Earth County has been inspected two or three times since 1995. The review includes verifying and updating information related to both the site and the necessary permits. The Feedlot Officer schedules an appointment with each operator to inspect the feedlot site and to update the feedlot permit information and file. This personalized approach to feedlot management is proactive, consistent and flexible meeting the needs of both the County and the feedlot operator.

At the site the location of wells and open tile intakes are verified, site changes or potential problems are evaluated, and the visible portion of manure storage systems are inspected. The feedlot review also includes meeting with each feedlot operator to verify and update each feedlot's data and permit information, including owners/operators contact information, manure management plans, type and number of animals, site capacity, and manure spreading acres.

Education

The County Feedlot Officer has both conducted and been involved with meetings directly related to feedlot management. The County and SWCD have also been involved with field days, tours and demonstration projects related to nutrient and feedlot management, partnering with Minnesota Extension Service and the MDA.

The County Feedlot Officer regularly mails information directly to every feedlot operator. Manure application setback reminders are mailed at least once a year. The County Feedlot Officer also prepares press releases, articles and paid advertisements.

Inventory and Data Management

Blue Earth County's feedlot inventory is maintained with an electronic data base (Access) and file system. Each feedlot site has a designated file that contains copies of manure spreading agreements and a map of each field identified on the permit, permit applications, permits, general correspondence, construction reports, FLEVAL results,

and anything related to violations if applicable. The County will be enhancing its GIS based data management system during the planning period.

The County maintains and reports feedlot data to the State as required using eLINK.

Manure management plans
All feedlots with 300 or more animal units are required to have manure management plans according to State rules. Smaller feedlots with pollution problems can also be required to have manure management plans. Most feedlot operators in Blue Earth County have manure management plans. Certified crop consultants are increasingly used for preparation of manure management plans.

Ideally a manure management plan is an active document that is part of a larger program for total farm management. A manure management plan includes soil tests, manure tests, commercial fertilizer needs, and maps of fields where manure will be applied and records of where and how much manure was applied.

The NRCS offers manure management incentive programs for manure management planning. NRCS manure management programs are one-time, three year programs. The producer is eligible for manure management plan incentive payments for three years and can be in the program only once. An NRCS-certified technical service provider prepares the manure management plans. The NRCS staff relies mainly on the expertise of the technical service provider for manure management plans.

Manure Spreading Acres
The County has been maintaining a paper map of manure spreading acres reported for each feedlot. This was initiated many years ago to make sure feedlot operators have adequate land area for spreading manure from each individual feedlot without duplication of fields. The feedlot operator is required to identify which fields will be used and must either own the land or provide copies of manure spreading agreements between the land owner and the feedlot operator. The County will be enhancing its GIS based data management system during the planning period to record which fields feedlot operators will be using for manure application.

State rules require each feedlot operator maintain records of where manure was applied. The County Feedlot Officer does check and verify that the feedlot operator has kept records. Not all feedlot operators are keeping records. This is considered a violation, and the County Feedlot Officer works with that feedlot operator to be in compliance. The County doesn't keep copies of the feedlot operator's records.

Manure Application
Manure application set backs are difficult to enforce, but the County, as part of the State program requirements, has begun spot-checking fields for compliance with setback and other manure application rules. The most common manure application violations among both private and commercial applicators relate to encroachment into required manure application set backs from intermittent streams, drainage tile intakes and road ditches.

Ideally manure is applied on the flattest ground possible and incorporated immediately in order to prevent runoff of manure and nutrients in water and with soil. Feedlot operators are required by State rules to record where and at what rates all manure was applied.

Manure should not be applied in close proximity to surface waters, tile intakes or other environmentally sensitive features. State and County regulations include setbacks from environmentally sensitive features. These setbacks vary depending on whether manure is incorporated and if on frozen ground. Blue Earth County manure application set backs from some surface water features are more restrictive than the State.

Winter application of manure is a greater potential pollution problem because of a higher likelihood of run off during snow melt and rainfall before the ground thaws. Winter application of manure is limited to flat ground. MPCA and County regulations for winter application of manure prohibit manure application on slopes of greater than six percent. All types of livestock manure are applied in the winter in Blue Earth County. Limited storage capacity and seasonal conditions necessitate winter application of manure in some cases. Some dairy operations apply manure year round.

There are many commercial applicators operating in Blue Earth County. Commercial manure applicators are licensed by the MDA. Blue Earth County administers the written test locally. Currently there are about five commercial applicators available for hire and close to 20 licensed applicators in Blue Earth County.

Land Use Regulations
In addition to its State-delegated authorities and responsibilities, Blue Earth County manages feedlots with local ordinances. The ordinances are contained in three sections of the County Code: *Livestock* and Manure Management, Zoning and Shoreland.

Livestock and Manure Management Section of County Code
The *"Livestock and Manure Management Ordinance"* was adopted in January 1994 with program implementation beginning in January 1995. This section of the County Code regulates the location of feedlots, setbacks for feedlots and manure application, maximum size of a feedlot, lot area, and contains the standards required for a County feedlot permit.

Examples of some of the standards for contained in Code are:

- Lot Area: 40-acres for a feedlot of 1,000 animal units or greater; 10-acres for a feedlot under 1,000 animal units.
- Density or size – A new feedlot or expansion may not exceed 3,000 animal units.
- Setbacks
    a. Feedlot-Dwelling Mutual Setback of:
        i. 500 feet for Feedlots between 10 and 50 animal units.
        ii. 1,000 foot or 1,500 foot setback based on prevailing winds for feedlots over 50 animal units
    b. 100 feet from a public or private drainage ditch
    c. Must not be in a 100-year floodplain
    d. 30 feet from the top of a steep slope.

The Livestock and Manure Management Section of County Code also contain standards and setbacks for manure application. Blue Earth County's manure application setbacks are greater than the MPCA for intermittent streams, tile intakes, ditches, lakes and wetlands.

Manure Application Set Back Differences Between County Livestock Ordinance and MPCA
Set-backs shown are with incorporation

Intermittent streams:	County- 50'	MPCA- 25'
Tile intakes:	County- 25'	MPCA- 0'
Drainage Ditches:	County- 25'	MPCA- 25'
Lakes:	County- 100'	MPCA- 25'
Wetlands	County- 50'	MPCA- 25'

Some Blue Earth County regulations are more restrictive than the State. The County animal unit conversion for finishing pigs is 0.4 and the MPCA is 0.3.

Zoning Section of County Code
The Zoning section of the County Code also regulates where feedlots can be located. Land in the unincorporated portions of the County is divided into eight zoning districts. New feedlots are only permitted in the Agricultural District. This district encompasses approximately 90 percent of the land area in the County. Prior to 1996, feedlots were also allowed to be constructed in the Conservation District. In June of 1996 the County Zoning Ordinance was amended to prohibit new feedlots from being located in the Conservation District, which is located adjacent to the County's rivers, streams, lakes and some bluff areas.

Feedlots or feedlot expansions over 100-animal units in the Agricultural Zoning district must obtain a Conditional Use Permit prior to being constructed. Conditional Use Permits are approved or denied by the Blue Earth County Board of Commissioners following a legally-noticed public hearing held by the Planning Commission. Conditions of approval are placed on the producer. With a typical Conditional Use Permit, there are approximately 14 conditions that are required to be met before the feedlot is constructed and operated. The conditions range from approval required by other agencies like the MPCA and DNR to requirements for manure management and dead animal disposal. All Conditional Use Permits for feedlots require that the applicant obtain a County Feedlot Permit, which then becomes the permit which guides the operation of the feedlot. Although it is rare, a Conditional Use Permit can be reviewed and potentially revoked by the County Board of Commissioners if conditions of the Permit are violated.

Proposals for feedlots with a capacity of 1,000 animal units or more require an MPCA NPDES permit and are forwarded to the MPCA for approval before the local permitting process.

Shoreland Section of County Code
The Shoreland section of the County Code also plays a role in the location of feedlots. Shoreland is defined as land within 300 feet of a DNR protected river or stream or 1,000 feet of a lake. As of 1998, new feedlots are prohibited from located within Shoreland Areas. Prior to then, feedlots were allowed to be located in the Shoreland of lakes, provided they met a 300 setback from the ordinary high water level.

Other Blue Earth County Permits and Inspections
A Blue Earth County Construction Permit is issued for new feedlot structures in addition to the feedlot permit and CUP. The Feedlot Officer visits each construction site before construction and during construction to ensure compliance with all structural set backs. The Feedlot Officer is also present during construction of concrete manure storage structures.

Feedlot building construction can also involve other County staff. If showers and/or bathroom facilities are part of the facilities, a small SSTS or holding tank will require a County permit and inspections. New wells and properly abandoning and unused wells also require County permits and site inspections.

Stormwater Management
Runoff and soil erosion during construction are a concern for all types of building construction in the County. For feedlots, the MPCA requires sediment and erosion controls at feedlot construction sites as part of the feedlot permit. The County Feedlot Officer evaluates each site before permits are issued. The Feedlot Officer also gives the owner and contractor an MPCA information sheet relating to best stormwater management practices. Final seeding and stabilization are also required in County permits.

NPDES permits are required for feedlots with a capacity of 1,000 or more animal units and are issued by the MPCA. Feedlots with less than 1,000 animal units are required to have an MPCA construction permit short form issued by the County. The MPCA construction permit short form indicates that sediment controls and stabilization best management practices are required on site and down gradient before, during and post construction. These practices include: seeding, grading, compacting, mulching, fiber rolls, textile fencing, keyed and staked hay bales, and other practices designed to reduce runoff and erosion.

Manure Storage Construction
MPCA requires engineered plans for construction of storage structures with the capacity of 20,000 gallons or more. The County Feedlot Officer has a pre-construction meeting with the owner, project engineer and excavator. The MPCA inspects construction when the capacity is 1,000 or more animal units. The County Feedlot Officer asks to be notified when the concrete is poured. County staff visits the site at that time and documents cracks, dirt balls in concrete, the perimeter tile or other concerns. The project engineer must be on site when ten or more yards of concrete is used for construction. The feedlot owner is required to have the design engineer submit a construction report to the MPCA and the County Feedlot Officer within 60 days of completion.

In Blue Earth County most in-ground manure storage systems, including below-barn concrete manure storage pits, are constructed below the natural seasonal high water table. Most important to the design is to reduce pressure on the pit walls from water in the surrounding soils. This is accomplished with perimeter tile.

Other issues

Livestock Mortality Management

Livestock mortality is a concern due to disease and the potential for runoff of fluids and leachate associated with decomposing dead animals to road ditches, surface water and tile intakes. Most feedlot operators in Blue Earth County dispose of dead animals at off-site processing rendering facilities in southern Minnesota.

Some feedlot operators compost dead animals on-site in specially built, enclosed structures. Composting dead animals can help control disease by eliminating the rendering truck. The compost provides a small amount of crop nutrients.

Management of dead animals is not regulated by the MPCA Feedlot rules. The Board of Animal Health regulates dead animal disposal.

Pastures

Blue Earth County doesn't maintain an inventory of pastures because pastures are exempt from State feedlot rules. Of the few known pastures in the County, some do provide access to a lake or stream. Any livestock causing a pollution problem in surface waters are regulated by the DNR. The County has worked with a few pasture owners to fence livestock away from surface water. Of the known pastures in the County, most are owned by very small farmers, and the likelihood the site will change hands or expand is small. It is unlikely new pastures will be established in the planning period as land prices and user markets are greater for crop production and conservation/recreation compared with use of land for pasture.

IMPLEMENTATION PLAN
Feedlots and Manure Management

Water Management Plan Goal:
Protect and improve water quality with implementation of livestock management programs, policies and best practices to prevent and minimize pollution from livestock manure.

GUIDING PRINCIPLES:
» Animal agriculture is important to the economy of Blue Earth County
» Livestock manure is a valuable fertilizer and soil amendment that improves crop production.
» Livestock manure has the potential to cause water pollution problems when not managed properly in environmentally sensitive areas.
» Environmentally sensitive areas include: lakes, rivers, streams, open tile intakes, ditches, wetlands, coarse-textured soils, steep slopes, shallow soil over bedrock, wells and wellhead protection areas, Drinking Water Supply Management Areas (DWSMAs).
» Blue Earth County regulates feedlots in accordance with State rules and a delegation agreement.
» Blue Earth County works directly with individual feedlot operators combining regulation and education to achieve water quality goals.

ONGOING ACTIVITIES:
Blue Earth County will continue its Feedlot Program. Working with feedlots operators individually has been proven to be an effective approach for implementing the County's education goals and regulatory requirements. The County will be enhancing the existing program with the use of GIS to provide education and information to feedlots operators, businesses preparing manure management plans, and those applying manure.

The Blue Earth County Feedlot program is currently funded with a combination of annual permit fees paid by feedlot owners to Blue Earth County, the County, and the MPCA feedlot grant.

The Blue Earth County SWCD and the NRCS will continue to work with feedlot operators to establish best land management practices including 1) technical assistance, 2) construction oversight, and 3) administration of cost share and other financial programs as funds are available.

WATER MANAGEMENT PLAN:
Livestock manure generated at feedlots can be a source of bacteria, TSS, phosphorus, nitrogen and other pollutants. Runoff containing manure used as fertilizer is likely the greatest source of pollution to surface waters from livestock manure. Working with

feedlot operators and related businesses to improve nutrient management planning and application methods in environmentally sensitive areas will be the most important actions related to livestock production and feedlots during the planning period. The County will be the lead agency for feedlot and nutrient management.

Preventing and reducing runoff and protecting groundwater are high priorities of the *Water Management Plan 2008-2013*. Best management practices to reduce runoff address many types and sources of pollutants. Reducing runoff from agricultural land uses is addressed more thoroughly in the Agricultural Land Runoff Section of the plan.

Objective 1. Work with all feedlot operators to improve manure management planning.

The County, SWCD, NRCS, crop consultants, MPCA and MES all work with feedlot operators on manure and nutrient management planning. Improving feedlot operators manure management will require the efforts of all involved with manure management. Improvements will be made with communications between and among those involved, by providing easier access to local information and more detailed, site-specific information with a special focus on environmentally sensitive areas as defined by the MPCA and Blue Earth County. The County will be using GIS to enhance the hands on approach to feedlot program management. GIS, LIDAR and aerial photos will be used to develop specialized mapping and graphics for manure management education and discussion with individual feedlot operators.

Action 1: The County will meet with 100 percent of feedlot operators and crop consultants to improve manure management planning.

Action 2: The County Feedlot Officer will enhance review of manure management fields and field/site specific discussion of sensitive areas and requirements (ground water contamination maps, bedrock, slope, soils, floodplains, ditches, surface water features, two foot contour maps, property boundaries, aerial photos and other information).

Action 3: The County will develop a program to provide County/SWCD web site access to local information about sensitive areas and requirements (ground water contamination maps, bedrock, slope, soils, floodplains, ditches, surface water feature, two foot contour maps, property boundaries, aerial photos and other information).

Action 4: The County and SWCD will enhance its general, feedlot education program by providing information about applying manure in sensitive areas such as surface water and shallow soil over bedrock for distribution and display at the SWCD/NRCS office.

Action 5: The SWCD, County and other organizations will participate in local demonstrations, field days and workshops as appropriate and report the results in newsletters and other communications.

Objective 2: Improve manure management in areas with high susceptibility to ground water contamination due to shallow depth of soil to bedrock.

The County will be working with policy makers at the Township level, feedlot operators and horse owners with fewer than ten animal units to provide information related to the best location and design of barns and other areas occupied by livestock and horses, and manure storage, handling and land application to protect ground water resources in areas with shallow depth to bedrock. Many horse owners are smaller than ten animal units and are not included in the County inventory. The type of technical and other assistance needed is unknown at this time but may include construction of impermeable manure storage areas to prevent infiltration, rotational grazing, and other best management practices to prevent infiltration of manure to ground water. Many horse owners are not farmers and may not be eligible for some types of financial assistance or incentives.

Action 1: Identify feedlots in areas with high susceptibility for ground water contamination and shallow depth to bedrock.

Action 2: Work with the Lime Township Board, feedlot operators and horse owners in Lime Township by providing information related to improving site management and manure management and identifying small sites with potential problems.

Action 3: Provide site specific information and other resources to feedlot operators in areas with shallow depth to bedrock.

Action 4: Provide technical assistance to horse and livestock owners to reduce the potential for ground water contamination from manure.

Action 5: Assess the need for and availability of financial assistance to horse owners to improve manure management.

Objective 3: Reduce runoff from agricultural fields.

With implementation of the enhanced manure management education actions identified in the County Water Management Plan and the ongoing feedlot program, feedlot operators will continually improve manure management, applying manure at agronomic rates, incorporating manure, maintaining set-backs from environmentally sensitive features, and avoiding manure application on steeper slopes. Ultimately, the result will be little manure or nutrient runoff in most years. However, the timing of storm events, very wet field conditions due to heavy rainfall, and human error can create circumstances where manure and nutrient runoff is more likely to occur. Vegetated buffer strips and grassed waterways do help trap manure and nutrients when runoff occurs. Grassed buffer strips along ditches and intermittent streams and around tile intakes increase options for manure application, and recommended manure application setbacks are reduced.

Recognizing these factors and the multiple water quality benefits of buffer strips, buffer strips to reduce runoff and manure-related pollutants will be a high priority action during the planning period.

Action: Establish buffer strips, terraces and grass waterways to protect surface waters from runoff from agricultural fields.

Objective 4: Reduce manure runoff problems from livestock feedlots and smaller sites.

There are a few small remaining open feedlots with runoff problems or potential for runoff in the County. A few sites with fewer than ten animal units are stocked from time-to-time. These smaller sites have the potential to be a pollution problem but their locations are unknown as sites with fewer than ten animal units generally are not required to have a feedlot permit. Technical assistance and some financial assistance is available from the SWCD and NRCS.

Action 1: Provide technical assistance to operators of feedlots with open lot agreements to correct pollution problems by 2011, the State feedlot program compliance deadline.

Action 2: Provide technical assistance to feedlot operators and owners of small sites to address pollution problems.